

Health Effects of Diesel Exhaust

CT DEP Diesel Reduction Policy
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Diesel Exhaust

- Exposure to Diesel Exhaust is an important public health problem.
- Huge body of scientific literature says exposure to diesel exhaust can cause many health effects.

What Is Diesel Exhaust?

- Produced when an engine burns diesel fuel.
- Complex mixture of hundreds of chemicals in either
 - Gas phase
 - Particle phase

Diesel Exhaust – Gas Phase

- CO, SO_x, NO_x,
- Many toxic air pollutants
 - Aldehydes (formaldehyde, acetaldehyde, acrolein)
 - Benzene
 - 1,3-butadiene
 - PAHs
 - Nitro-PAHs

Diesel Exhaust – Particle Phase

- **Many types of particles (PM) Classified by SIZE**
 - Fine particles are greatest health concern (2.5 microns and smaller)
 - PM in diesel exhaust is almost entirely fine PM
 - In New England, diesel engines are responsible to >20% of the human made fine-particle pollution
- **Particles made mostly of carbon with adsorbed compounds**
 - Organics
 - Sulfate
 - Nitrate
 - Metals

Diesel Exhaust – Health Effects

Immediate Health Effects

- **Irritation**
 - Eyes, nose, throat, lungs
- **Cough**
- **Headache**
- **Nausea**
- **Inflammation in the lungs**
 - Aggravate chronic respiratory symptoms
 - Increase frequency/intensity of asthma attacks

Diesel Health Effects cont.

- Large, long-term epidemiology studies on fine PM
- Increased morbidity and mortality
- Increased Risk of Lung Cancer

Increased Morbidity & Mortality

- **Increased hospital admissions and ER visits**
- **Increased asthma attacks**
- **Cardiovascular death**
- **Increased frequency of childhood illnesses**
- **Reduced lung function**

Elderly and people with pre-existing lung or heart disease are especially sensitive.

Children are more susceptible than healthy adults.

What About Cancer?

- Diesel exhaust contains numerous mutagens/carcinogens, some fairly potent
- Particles themselves can promote cancer in deep lung via inflammation
- 30 Epidemiology studies over past 40 years – strong evidence that long-term exposure to diesel exhaust increases the risk of lung cancer

What About Cancer? (2)

- Diesel exhaust is classified as a probable human carcinogen by many governmental authorities including IARC (WHO), US National Toxicology Program (NIH) and EPA
- CA considers diesel exhaust to be a known human carcinogen.

How Is DPH Involved?

- Following the science on diesel and health effects for many years.
- Support anti-idling policy for school buses
 - EPA Tools for Schools Program
 - Coordination with local health directors
- Environmental Public Health Tracking Program
 - Building a system to link fine PM pollution with health effects
- New opportunities for collaboration with DEP on CT Diesel Plan!